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**FACULTY WORKING
PAPER NO. 751**

The Use of Industry Norms in Evaluating Firm Performance

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February 1981

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Evaluating Firm Performance

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Abstract

Managers are often advised by researchers in the areas of wholesaling, retailing, financial, and small business management to utilize representative industry figures (i.e., means or medians) on critical income statement, balance sheet, and general management variables to (1) evaluate their firm's present performance, and (2) direct their efforts in attempts to improve performance and profitability in the future. In most cases, aggregate industry data are presented on these variables and utilized in this evaluation process. This paper raises possible problems with this general approach. Specifically, where major marketing strategy variations exist among firms within an industry, aggregate industry figures may provide misleading information to business decision makers.

INTRODUCTION

Evaluating present performance and managing operations to enhance performance in the future are critical responsibilities for managers of all business firms. Benchmarks or standards of comparison are needed in evaluating firm performance on operational and/or financial variables. A firm's profitability measures such as return on assets, return on net worth, and return on stockholder's equity can be evaluated against alternative equivalent-risk investments, thus providing an accessible standard of comparison. Those income statement, balance sheet, and operating characteristics which ultimately lead to bottom line profitability, however, are not so easily evaluated.

In the search for standards of comparison, members of business firms often compare their firm's current performance and operating characteristics with comparable figures for their firm in previous years. While this procedure may track improvement or decline in performance over time, it offers no basis for evaluating the quality of its performance on specific variables. As such, managers often seek external benchmarks to aid them in assessing their business operation (c.f., Sanzo 1977, Duncan and Hollander 1977). Aggregate industry norms, usually in the form of averages or medians, are readily available from a large number of sources, and are thus a convenient source of much needed comparative or benchmark data. Unfortunately, as discussed below, such data may not be appropriate for this purpose. Due to product-based (as apposed to market based) industry classifications and major marketing strategy differences within industries, aggregate measures of central tendency may be highly misleading when

used as standards of comparison. The use and availability of such industry data will be documented, followed by a discussion of potential problems inherent in this approach. Such problems will then be illustrated with an example from the medical supply and equipment industry.

Industry Data

Use and Availability.

Large firms whose major competitors are publically held have a variety of data available from published sources on which to compare their relative performance (e.g., 10K reports, annual financial reports). However, as indicated by Westwick (1973), typically only a small percentage of the desired information are available from these sources. As such, large firms often seek representative industry figures on other critical variables for use as standards of comparison.

Smaller business organizations lack even those data available to the larger organization. Since their competitors are often privately held, published information is often unavailable. Additionally, small firms lack the highly trained staff specialists available to the larger firm for analyzing their operations. For these reasons, representative industry figures are again sought for comparative purposes.

Writers in the areas of small business, retailing, wholesaling, and financial management have recommended the use of industry average figures for control purposes (c.f., Sanzo 1977, Duncan and Hollander 1977, Broom and Longenecker 1975, Grieco 1975, Bearchell 1975, Weston and Brigham 1972, Hill 1963). Bearchell (1975) indicates that industry wide data provides the manager with an idea of how he stacks up against others in the same

business. As Duncan and Hollander (1977, p. 665) state, "Direct comparisons indicate weaknesses and enable management to adopt measures to correct them." The Small Business Administration has published manager guides and pamphlets for a variety of industries and recommends the general use of aggregate industry data for comparison purposes (c.f., U.S. Small Business Administration's Starting and Managing Series 1962, 1965, 1972).

Industry averages and/or medians on a variety of management variables and key operating ratios are supplied to businesses by a large number of agencies and/or organizations. Federal agencies sometimes supply these data. For example, the U.S. Department of Commerce publishes monthly retail trade reports including charts and tables detailing regions, kinds of business, department store sales in selected areas, end of month account receivables and inventories, and inventory-sales ratios. Private research organizations such as Dunn and Bradstreet, Robert Morris and Associates, the Economist Intelligence Unit, and the Accounting Corporation of America provide information on key operating ratios for a large number of industries. Industry trade associations such as the Innkeepers of America and the National Automobile Dealer's Association provide industry averages to their members.

In a large number of these reports, averages or median data across the entire industry on each variable or operating ratio are presented. For example, the Financial Research Associates (1976) present "typical" composite balance sheet and income statement data followed by sixteen ratios dealing with liquidity, leverage, activity, and profitability for a variety of retailing and wholesaling industries. The Food Marketing Institute (1980) present annual balance sheet and income

statement data for the entire supermarket industry (also see Dunn and Bradstreet 1979, American Gas Association 1976). In other cases, the data are broken down into categories based on a firm's relative sales volume (c.f., Robert Morris Associates 1978, American Meat Institute 1980, National Kitchen Cabinet Association 1980), total assets (c.f., Troy 1977, U.S. Federal Trade Commission 1977), and/or geographical area or country (c.f., American Supply Association 1980, National Paper Box Association 1980, Horwath and Horwath International 1980). For example, the Supermarket Institute (1980) provides industry average figures for supermarkets and grocery stores across each of three sales volume categories, whether high, medium, or low. Robert Morris Associates (1976) provide a bibliography of over 100 sources of composite financial data. Sanzo (1977) lists trade associations which have published ration studies.

Potential Problems

Hill (1963) has noted the importance of having a similar group of firms to make this general performance evaluation approach work. Indeed, a high degree of similarity among the firms is indispensable to the value of comparative ratio analysis. As suggested by Day, et. al. (1979) and Frazier and Howell (1981), industry classifications may not ensure a high level of business firm similarity. If highly dissimilar groups of firms exist within an industry, representative industry data may lead to improper interpretations and misdirected managerial action. Breakdowns by sales volume category, total assets, or geographical region may not be enough.

THE QUESTION OF BUSINESS FIRM SIMILARITY WITHIN AN INDUSTRY

A critical issue for the aggregation of industry data is the definition of the industry itself. As noted by Day, et. al. (1979), traditional industry classifications tend to be product or production process oriented. This is particularly true of standard industrial classification (SIC) codes, which provide the aggregation basis for much of the government and private reporting agency financial, operating characteristics, and ratio data. While trade association boundaries rely to a greater extent on a member self-selection process, these organizations also seem to reflect an aggregation based on products sold or produced, perhaps subclassified by function in the channel of distribution (e.g., producer, wholesaler, retailer, etc.).

While product based classification are useful in terms of defining firms with similar supply-side characteristics, thus subject to a set of similar environmental forces and sharing some mutual interests, they do not account for potentially vast dissimilarities in markets served and marketing strategies employed. This is not intended to suggest that industries, as defined by either SIC codes or trade associations, be redefined on the basis of market served. Only when the market served is very large and homogeneous would a classification based on such criteria (e.g., a Government Contractors Association) be feasible. Indeed, it can be argued that producers or sellers of similar goods at a similar level in the distribution channel have more characteristics in common than firms selling different products to similar (broadly defined) markets.

It is suggested, however, that similarity of supply side characteristics is not sufficient to produce the degree of homogeneity

necessary for meaningful aggregation in the reporting of financial and operating characteristics and ratios. This is due to the market segmentation and marketing strategy decisions made by the firms within a given product-defined industry.

Market segmentation, or the strategy of concentrating the marketing efforts of the firm on groups of consumers who are homogeneous in one or more respects, has long been recognized as a basic tenet of successful marketing. While firms may choose varying degrees of segmentation, following an unconcentrated strategy involving little or no segmentation; a differential marketing strategy involving serving multiple market segments with specific products and marketing programs; or a concentrated strategy, wherein the firm consolidates its efforts on one or a few particular submarkets (Kotler 1980), only large firms are able to follow the unconcentrated or differentiated strategies. The small firm must concentrate its limited resources on a marketing program designed to serve a limited and well-defined group of consumers.

This decision on which market(s) to serve and how to serve them is so basic to the operation of the firm that it affects virtually all aspects of the business, including the financial and operating characteristics of the firm. This is particularly true of income statement entries and general management ratios which are closely tied to the marketing activities of the firm, such as gross margin, selling expenses, advertising expense, average order size, sales per salesman or sales per square foot, etc. Also affected may be balance sheet items such as inventory and accounts receivable, and ratios which include these items with income statement data (inventory turn, day's sales in accounts receivable, etc.)¹

Thus, the manager using industry averages or medians as benchmarks for evaluating the position/performance of the firm may be comparing against firms which are quite different from the manager's own. The need to compare "like with like," which is well recognized (Hill 1963), may not be met when using industry classifications as the basis for determining "like" firms. While, as noted previously, many sources of such data disaggregate their measures of central tendency by size of firm (usually 2-4 separate dollar sales categories) or by geographic region, this is not sufficient to account for major market segmentation strategies in the industry.

For an aggregate measure of central tendency to be a valid basis for comparison, its distribution should resemble the distribution depicted in Figure 1. In such an industry, the operating characteristic (e.g., gross margin or inventory turnover) is unimodal and symmetric with a relatively low degree of dispersion about the mean (which, in this case, is equal to the median).

Consider, however, an industry characterized by two prevailing marketing strategies, such as that depicted in Figure 2. Assume that group A firms tend to follow a high markup-low volume strategy, while those in group B are the "discounters," seeking a high volume of business at a lower price. These strategies (based on serving different market segments) roughly characterize many industries. Note that a measure of central tendency here could be very misleading; it is descriptive of few (probably unprofitable) firms. If managers in either groups choose to adjust their, say, gross margin toward what they perceive as the industry average, without adjusting other aspects

of their business, the results could be damaging. On the other hand, if many key operating characteristics are adjusted, the firm is moving toward a strategy which serves neither market segment well.

This tendency of averages or medians to be misleading is only exacerbated in situations where the distribution is multimodal, where there is lack of symmetry in each group, and where the groups are of unequal size. This, unfortunately, probably describes the situation in most industries. An example of such a situation follows.

EXAMPLE

Channel Setting and the Market Segmentation Decision

The potentially misleading nature of aggregate industry measures of central tendency is illustrated by the medical supply and equipment industry. Wholesalers in this field are represented by the American Surgical Trade Association. This industry would thus seem to represent a rather homogeneous set of firms, as compared with other more broadly defined industries, since its members are all dealing with a similar set of products and are all wholesale firms. Distinct market segments within this industry include (in order of their overall size) hospitals, physicians, nursing homes, laboratories, laity (i.e., sales direct to consumers), government agencies (i.e., other than government hospitals), and industrial clinics.

As indicated previously, the market segmentation strategy a firm selects and follows can influence many other aspects of the firm and effectively differentiate it from firm's following different segmentation strategies. This appears to be the case in this industry. A number of

wholesaling firms in this channel follow a segmentation strategy of concentrating their efforts in either the hospital or physicians segments due to their relative size. While some of them may have reasonably large percentages of sales from other segments (i.e., 30 to 45 percent), these firms gear their operations to their primary segment. As such, they will be referred to as either hospital concentrated or physician concentrated firms. The other segmentation strategy some wholesaling firms follow in this channel is to strive to serve multiple segments. A primary segment around which the firm organizes its operations cannot be identified under this approach. They will be referred to as mixed firms.

It is expected that the grand means of the wholesaling firms' income statement and general management variables and ratios will not adequately reflect the means of these variables across the segmentation strategy groupings. Hospital concentrated firms are expected to have relatively low operating expenses because of large size orders which serve to minimize selling, delivery, and order processing expenses. Pre-study interviews indicated that depth of each product line tends to be lower for hospital centered firms, thereby diminishing inventory expenses to a degree. As a result of the above reasoning, inventory turnover may be relatively high for these firms. However, based on hospital buying practices, hospital concentrated firms appear to face intense price competition, buyer price sensitivity, and competitive bid practices. The gross margin possibilities may be relatively low here as a result.

Physician concentrated firms appear to contend with a scenario almost the opposite of hospital concentrated firms. Gross margins appear to be relatively high for these firms reflecting small volume

purchasing, relatively low price sensitivity, and high service requirements. These same characteristics may serve to increase order processing, warehousing, delivery, and selling expenses. As such, total expenses may be relatively high for such firms. Because the depth of inventory carried in each product line appears to be very high for physician centered firms, low levels of inventory turnover may result. The degree of competitive intensity in this segment is moderate in comparison with the hospital segment (Stephenson 1977).

It is clear that operational difficulties are encountered when dealing with multiple markets. In the following a mixed strategy, the sales force must sell to a heterogeneous group of buyers each with varying needs and demands. The order processing function must handle a wide diversity of orders in terms of size and composition. The mixing of varying sets of inventory requirements will increase inventory requirements relative to overall sales volume (Stephenson 1977). The scheduling of deliveries to customers will be more difficult. All of these considerations will lead to a tendency for lower inventory turnover for firms in this category, in comparison with hospital and physician centered firms and higher operating expenses in comparison with hospital firms. The attractiveness of this strategy lies in the possibility of increased sales opportunity resulting from a large customer base. Wholesaling firms following a mixed strategy attempt to trade off structural characteristics of the available segments to enhance performance.

It is expected that the means on the firm's balance sheet variables, financial ratios, and profitability measures across the segmentation strategy categories will not be significantly different

from one another since, as noted previously, a variety of paths may lead to reasonably high levels of profitability. Poor management will cause poor financial returns whatever strategy a firm is following. Banks and financial institutions provide equivalent advice and credit terms across the entire group of wholesaling firms.

Data Collection

This project was part of a larger ongoing research project sponsored by the American Surgical Trade Association (Haring and Stephenson 1977). A mail questionnaire was utilized to collect the income statement, balance sheet, and operating characteristics data to be analyzed in this study. The questionnaire was formulated in an accounting system format with precise definitions of each profit and loss statement and balance sheet item. It followed the industry's recommended, standardized accounting format.

Questionnaires were sent to all 220 members of the American Surgical Trade Association in February of 1977. Responses were sought on the 1976 operating year. Trade association executives estimate that their membership includes 60 to 70% of the United States firms that are primarily engaged in the wholesaling of medical supplies and equipment (Stephenson, et. al. 1979). The three industry firms of national market scope (i.e., American Hospital Supply, Will-Ross, and General Medical) are not study participants. Usable responses were received from 129 firms representing a response rate of 59 percent. A comparison of these firms with general industry data supplied by the Trade Association indicated that the achieved sample is representative of the industry.

Classification of Firms into Segmentation Strategies. Each firm reported the portion of its total sales (e.g., 0 to 100%) that come from each of the available market segments in this industry. Firms were classified into "hospital," "physician," or "mixed" categories based on the following criteria.

- (1) Hospital Concentrated Firms: 55 percent or more of a firm's revenue is from the hospital market (i.e., 62 firms);
- (2) Physicians Concentrated Firms: 55 percent or more of a firm's revenue is from the physician market (i.e., 26 firms);
- (3) Mixed Firms: less than 55 percent of a firm's revenue is from any one market segment (i.e., 41 firms), with the majority of these firms deriving 20% to 35% of their business from each of at least three segments.

The 55 percent level was specified based on pre-study interviews with a sub-sample of wholesalers from this industry. It was felt that a firm with 55% of its revenue coming from one market can, at most, have only 45% of its revenue from another segment and, as a result, the former segment may be relatively dominant in terms of firm operations. Prior analyses indicated that the data were insensitive to various cut-off levels ranging from 45 to 75%, that the conclusions drawn from study results are highly stable.

ANALYSES RESULTS

Tables 1 through 3 exhibit the means on the (1) income statement variables, (2) balance sheet variables, and (3) other important managerial benchmarks for the aggregate group of wholesaling firms as well as the segmentation strategy categories. Results of an analysis of variance on each variable or benchmark are also presented.

As expected, aggregate means across all the wholesaling firms reflect the balance sheet information in Table 1 and the financial

ratios in Table 3 fairly well. Only on the cash and accounts receivable variables are the means in the segmentation strategy categories significantly different from the grand mean. Thus it appears wholesaling firms in this channel can generally use representative industry figures on financial and/or profitability data in establishing performance benchmarks.

However, the majority of the data on the income statement variables in Table 2 and the general management benchmarks in Table 3 presents a different picture. In general, the grand means across these variables do not adequately represent the means within the segmentation strategy categories. These data support the earlier contention that there are dissimilar groups of firms within the medical supply and equipment channel based on the segmentation strategy they each follow.

These findings indicate that use of aggregate industry averages on the income statement and general management variables in (1) evaluating present firm performance, and (2) planning for improved performance in the future might be extremely misleading to a wholesaler in this channel. If a wholesaler attempted to adapt his operating characteristics to the grand means, the firm's future performance and profitability may actually be hampered. Consider the following example. Assume that a wholesaler selling primarily to physicians is slightly below his group's mean on total sales expense (7.7% in Table 2) and slightly above his group's grand mean on average order size (\$62 in Table 3). Thus, although he may seek improvement on these variables, they certainly do not appear to present serious problems. However, also assume that he does not have data presented by segmentation strategy and is seeking external benchmarks

on these variables. He may turn to aggregate industry data which, as indicated previously, are often the only type of data available in published form to managers on such variables. He would observe that his total selling expense is much higher than the overall industry average of 5.8% (Table 2) and his average order size is much lower than the general industry benchmark of \$118. In an attempt to enhance his firm's performance and profitability, he may attempt to revise his salesperson compensation system and call schedule as well as the general objectives and guidelines that he stresses to his sales forces in order to move his firm's figures closer to the industry averages. Such actions may be entirely inappropriate based on the nature of the market his firm is serving. These managerial actions may serve to disrupt his sales force and general operations and decrease his firm's performance in the future.

In the above example, a wholesaler overreacted and tried to alter variables on which his present performance was at reasonable levels. While this may disrupt his firm's performance, it appears that complacency based on inappropriate evaluations of aggregate data may be an even more serious problem. For example, a hospital firm may have much higher total expenses than his group norm (17.1%). However, he may be near the industry average of 20.9% and thus fail to see the need to control his expenses. To carry this reasoning further, a "mixed" firm may have a gross margin near the industry average of 24.5% and thus feel his firm is performing reasonably here when indeed the group mean on this variable for similar firms is 27%. Thus the data in Tables 2 and 3 point to the critical need to present benchmarks and/or

standards of comparison by segmentation strategy grouping on income statement and general management variables rather than in aggregate form to wholesalers in this channel.

CONCLUSIONS AND RECOMMENDATIONS

Empirical results in this study indicate that among wholesalers in the medical supply and equipment channel aggregate industry data on income statement and general management variables may be very misleading to managers of the wholesaling firms. In general, the grand means across these variables do not adequately represent the means of three groups of firms varying in nature on their respective segmentation strategies.

The generalizability of these results to other industries or levels within industries is unknown. However, this study does suggest that in industries where significant variations in marketing strategy exist, the chances of aggregate industry data being misleading to managers appear to be high.

Two main recommendations result from this study. First, managers must carefully evaluate industry-wide data in making their performance evaluations and plans for the future. If the representative industry figures are based on an aggregation of highly dissimilar firms, such data may be extremely misleading. Regretfully, managers finding themselves in this situation still face the problem of how to judge the relative performance of their firm on key income statement and management variables.

The second recommendation seeks to alleviate this problem. Presenters of data should design their data gathering techniques so as to

account for significant variations in marketing strategies among firms within an industry. Then, they could publish these data in a more disaggregate form, perhaps along the lines suggested in this paper. In cases where dominant segmentation/marketing strategy groups cannot be identified or where such groups are too numerous for parsimonious reporting of data, a more complete description of the distribution may be required. In addition to medians or means, measures of dispersion could be included and explained. Additionally, frequency instructions could be presented such that significant multimodality or skewness in the distribution can be assessed.

This paper does not suggest that industry wide, aggregated data are inappropriate in all situations. It does, however, indicate that traditional industry classifications, which may include a number of sub-industries, may be inappropriate as criteria for aggregation. It is important for researchers and data presenters to define the industry in terms of markets and competitive structure before gathering and then disseminating representative industry data, and to present enough information for adequate evaluation of the degree to which the data presented are representative of firms in the industry.

FOOTNOTES

¹Other balance sheet items may be less sensitive to market segmentation/marketing strategy decision, since they are influenced by a wide variety of other factors and considerations. Similarly, overall profitability as measured by Return on Investment or Return on Assets is affected by balance sheet items not closely tied to marketing strategy. Additionally since multiple paths to successful firm performance exist (Stephenson 1977), ultimate profitability levels may exhibit little variation which is dependent upon the marketing strategy decision.

Figure 1

IDEAL INDUSTRY-COMPARISON SITUATION

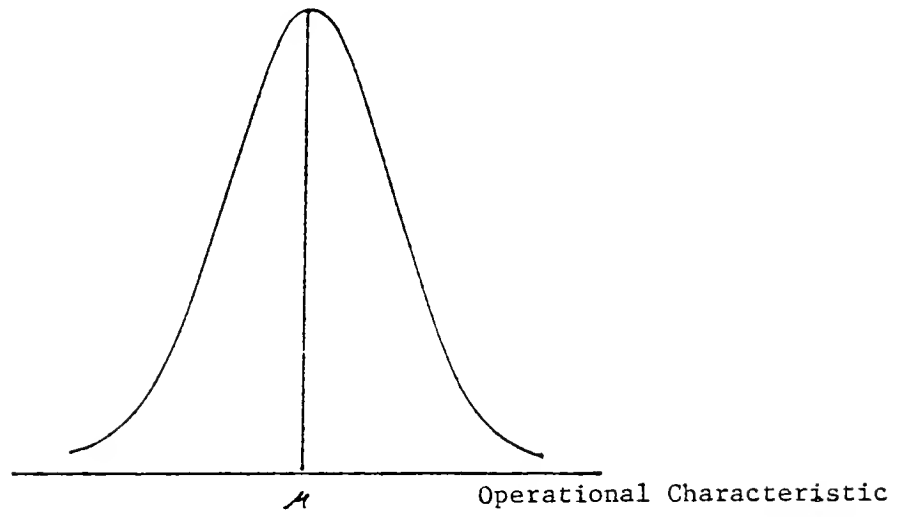


Figure 2

MISLEADING INDUSTRY MEAN IN BIMODAL CASE

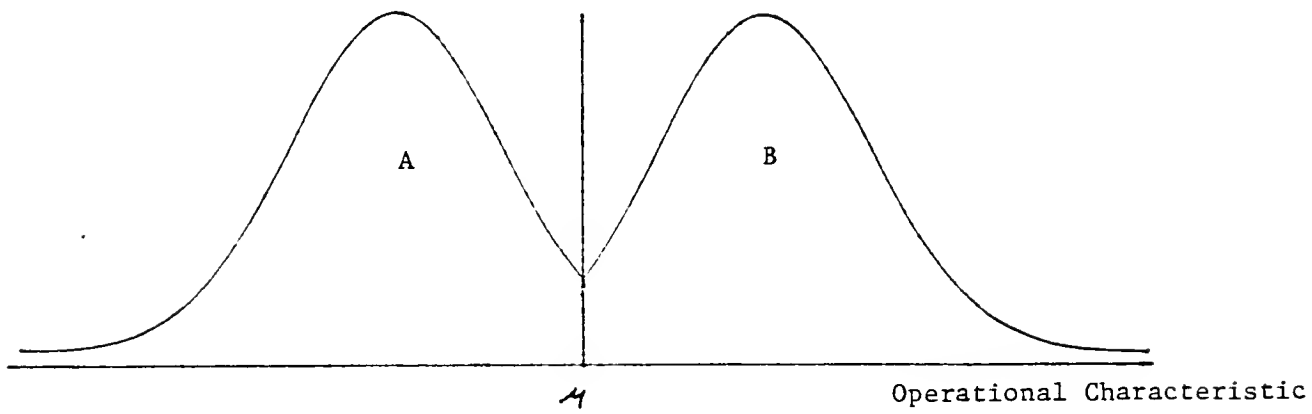


TABLE 1

BALANCE SHEET INFORMATION FOR THE WHOLESALING FIRMS

	<u>All Firms (129)</u>	<u>Hospital Firms (62)</u>	<u>Physician Firms (26)</u>	<u>Mixed Firms (41)</u>
Total Assets	1.3 million (100%)	1.9 million (100%)	.5 million (100%)	.8 million (100%)
<u>Current Assets</u>	91.6%	93.1%	90.5%	90.2%
Cash ^b	4.4%	3.3%	6.9%	4.4%
Accounts Receivable ^a	40.6%	43.7%	38.7%	36.9%
Inventory	44.8%	45.1%	42.4%	45.9%
Other	1.8%	1.0%	2.5%	3.0%
<u>Fixed Assets</u>	8.4%	7.0%	9.5%	9.8%
Liabilities and Net Worth	(100%)	(100%)	(100%)	(100%)
Liabilities	51.9%	49.4%	51.2%	56.0%
Net Worth	48.1%	50.6%	48.8%	44.0%

^a_p < .01

^b_p < .10

TABLE 2
INCOME STATEMENT INFORMATION FOR THE WHOLESALING FIRMS

	<u>All Firms (129)</u>	<u>Hospital Firms (62)</u>	<u>Physician Firms (26)</u>	<u>Mixed Firms (41)</u>
Net Sales	4.9 million (100%)	6.5 million (100%)	1.6 million (100%)	4.6 million (100%)
Cost of Goods Sold ^a	75.5%	79.9%	68.8%	73.0%
Gross Profit (Margin) ^a	24.5%	20.1%	31.2%	27.0%
<u>Expenses</u>				
Total Sales Expense ^a	5.8%	4.8%	7.7%	7.1%
Salesperson Wages ^a	5.0%	4.2%	6.4%	5.4%
Selling Expense ^a	.8%	.6%	1.3%	.7%
Warehouse Expense ^a	3.1%	2.7%	4.2%	3.2%
Administrative Expense ^a	12.0%	9.6%	14.6%	13.9%
Total Expense ^a	20.9%	17.1%	26.5%	24.2%
Net Profit Before Taxes	3.6%	3.0%	4.7%	3.8%

^a_p < .01

TABLE 3

OTHER IMPORTANT BENCHMARKS AND RATIOS FOR THE WHOLESALING FIRMS

	<u>All Firms (129)</u>	<u>Hospital Firms (62)</u>	<u>Physician Firms (26)</u>	<u>Mixed Firms (41)</u>
<u>Financial Ratios</u>				
Return on Assets	10.9	11.2	11.7	10.2
Return on Net Worth	24.8	24.5	24.9	25.2
Leverage Ratio	3.6	3.6	2.6	4.2
Total Asset Turnover	4.8	3.3	3.2	7.1
<u>General Management Benchmarks</u>				
Average Order Size ^a	\$118	\$152	\$62	\$103
Sales per Salesman ^c	\$611,407	\$647,099	\$229,895	\$763,926
Sales per Employee ^a	\$122,335	\$153,156	\$74,833	\$105,437
Average Growth ^c	16.8%	16.6%	12.2%	20.0%
Equipment Sales ^c	22.6%	17.1%	27.2%	27.5%
Supply Sales ^c	77.4%	82.9%	72.8%	77.8%
Credit Sales ^a	94.2%	97.7%	96.4%	87.5%
Inventory Turnover ^b	3.8	4.6	4.0	3.4

^a_p < .01^b_p < .05^c_p < .10

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